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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,463	02/08/2007	**Ippeita Dan**	060380	7029

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EXAMINER	
BRUTUS, JOEL F	

ART UNIT	PAPER NUMBER
3777	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,463	DAN ET AL.	
	Examiner	Art Unit	
	JOEL F. BRUTUS	3777	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 6-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 6-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 6-11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towle et al (The spatial location EEG electrodes: locating the best fitting sphere relative to cortical anatomy) in view of Jouandet US Pat: (5,038,285) and further in view of Fox et al (Pub. No.: US 2003/0050527) and further in view of Tucker (US Pat: 5,291,888).

Regarding claims 1, 11 and 17, Towle et al teach the international 10-20 system electrode positions and 14 fiducial landmarks arc described in Cartesian coordinates. Test-retest reliability depended on the electrode position with greater measurement errors (maximum 7 ram) than midline locations. Location variability due to head shape was greatest in the temporal region, averaging 5 mm from the mean. For each subject's electrode locations a best-fitting sphere was determined (79-87 mm radius, 6% average error).

With regards to probe of claim 11 having irradiation point for irradiating radial ray or magnetic wave from head surface of a subject; It is well known in the art to use MRI probe with irradiation point to irradiate the head surface as disclosed by Towle et al above. To acquire MRI images, an artisan would irradiate a region of interest with

magnetic wave (emphasis added). Towle et al disclose the use of a computer to analyze a condition of the brain [see page 2]. The image data is obtained simultaneously of markers at positions on the head surface and brain Surface image (emphasis added).

Towle et al fail to teach minimum distance method or head/brain interior reference dotted line segment connecting method.

However, Towle et al teach a surface-fitting algorithm was used to transfer the electrode locations and best-fitting sphere to MR images of the brain and scalp [see summary]. Towle et al further teach Cartesian coordinates were determined using localized device [see page 2, methods].

Nonetheless, Jouandet teaches finding the average minimum distance between positionally closest reference points on adjacent slice surface lines; and repositioning the straight line representations in accordance with the findings [see abstract].

Applicant discloses the invention uses convex hull fitting for activating minimum distance search method [see 0020-0022, specification].

Accordingly, Fox et al teach convex hull fitting [see 0028, 0105 and 0108]. Fox et al also teach minimum distance from head surface can be created [see 0114].

In addition, Tucker has the capability of obtaining a minimum distance between head surface and brain surface expressed as a straight line [see column 5 lines 30-60].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Towle et al with Jouandet by using the minimum distance as taught by Jouandet for accuracy purposes and with Fox et al by using

convex hull fitting for efficiency and reliability purposes. One skilled in the art at the time the invention was made would have been motivated to combine Towle with Tucker by using expressing distance between head surface and brain surface as a straight line ; because straight lines are structurally significant because they provide the simplest vectors for the forces of either tension or compression [see column 5 lines 57-60].

Regarding claims 2, With regards to normalizing brain surface coordinates from a plurality of subjects onto a standard brain; Applicant discloses projection points on brain surface are determined with the international 10-20 system on head surface (for standard points) [see 0047-0048, specification].

Accordingly, Towle et al disclose the international 10-20 system as described above, can be used to normalize head images of subjects into a standard brain [see page 2, methods].

Regarding claims 6-7, Towle et al don't specifically mention coordinates of arbitrary points.

Nonetheless, Jouandet teaches calculating coordinates of arbitrary points with respect to reference points [see figs 11-17].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Towle et al with Jouandet; for accuracy and precision purposes.

Regarding claims 8, Towle et al teach test-retest reliability depended on the electrode position with greater measurement errors [see abstract].

Regarding claims 9-10, With respect to distance distribution, Applicant disclose that distance between head surface and brain surface is obtained by arbitrary points on head surface in 3D image are projected on brain surface [see 0031]. These limitations are taught above (emphasis added) and the method is accomplished with a computer program (see page 3).

3. Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towle et al (The spatial location EEG electrodes: locating the best fitting sphere relative to cortical anatomy) in view of Jouandet US Pat: (5,038,285) and further in view of Fox et al (Pub. No.: US 2003/0050527) and further in view of Tucker (US Pat: 5,291,888) as applied to claims 1 and 11 above and further in view of over Yamashita et al (US Pat: 6,611,698).

Regarding claims 12-13, Towle et al don't specifically mention light measuring apparatus.

Nonetheless, Yamashita et al teach a light measuring instrument that is applied to a test object, for example, the skin of the head, and light is reflected inside the test object thereby to detect the light passing through said test object and to image the cerebral interior [see column 5 lines 60-67 and column 6 lines 1-35]. The instrument is a multi channel light measuring apparatus with the number of measurement channels,

namely the number of measurement positions are assumed as 12, and the number of signals to be measured (analog/digital conversion channels) are assumed as 24 [see column 5 lines 60-67 and column 6 lines 1-35].

Yamashita et al teach in figs 3-5, a plurality of light incident positions, detection position and measurement position (these positions are used as irradiation point and detection point on a surface of the subject, emphasis added) [see column 7 lines 27-29].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Towle et al with Yamashita et al by using light; in order to increase visualization.

Regarding claim 14, Towle et al are silent to the near infrared.

Nonetheless, Yamashita et al teach semiconductor lasers each emitting the light of multiple wavelengths from visible to infrared ray ranges; a light emitting diode may be used as this light source instead of a semiconductor laser [see column 5 lines 60-67 and column 6 lines 1-35].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to modify the Yamashita et al reference by using near infrared region; because the living body is not harmed by application of the light.

Regarding claims 15-16, Towle et al don't specifically mention irradiation point and detection point corresponds to the central position along a straight line connecting these two points and detection point becomes maximum of distance distribution.

Nonetheless, Jouandet et al teach algorithm [see figs 11-17] that can determine head surface by using irradiation point and detection of Yamashita et al and transform them to correspond to a straight line connecting these two points and to become a maximum distribution due to magnetic interaction.

In addition, Tucker has the capability of obtaining a minimum distance between head surface and brain surface expressed as a straight line [see column 5 lines 30-60].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Towle et al with Jouandet by using the minimum distance as taught by Jouandet for accuracy purposes and with Fox et al by using convex hull fitting for efficiency and reliability purposes. One skilled in the art at the time the invention was made would have been motivated to combine Towle with Tucker by using expressing distance between head surface and brain surface as a straight line ; because straight lines are structurally significant because they provide the simplest vectors for the forces of either tension or compression [see column 5 lines 57-60].

Response to Arguments

4. Applicant's arguments filed 4/13/2011 have been fully considered but they are not persuasive.

Regarding claims 1-2, 6-11 and 17, Applicant argues that Jouandet does not teach “minimum distance search” between a head surface and the brain surface expressed as a straight line and Jouandet describes a method for deriving a planar representation of a 3D surface, creating a planar map.

Applicant agrees that Jouandet discloses finding "average minimum distance" as a straight line between reference points [see REM page 6] which can be applied by a skilled artisan to search minimum distance between a head surface and a brain surface.

Applicant argues that Tucker does not teach "minimum distance search" between a head surface and the brain surface expressed as a straight line.

The examiner disagrees because Tucker has the capability of obtaining a minimum distance between head surface and brain surface expressed as a straight line [see column 5 lines 30-60].

Applicant argues that Tucker does not teach "minimum distance search" between a head surface and the brain surface expressed as a straight line.

The examiner strongly disagrees because Applicant discloses the invention uses convex hull fitting for activating minimum distance search method [see 0020-0022, specification].

Accordingly, Fox et al teach convex hull fitting [see 0028, 0105 and 0108]. Fox et al also teach minimum distance from head surface can be created [see 0114].

Therefore, it is clear that one skilled in the art at the invention was made would have known to use Fox teaching would be able to search minimum distance between a head surface and a brain surface as described by Applicant.

Regarding claims 12-16, Applicant argues that Yamashita doesn't teach "minimum distance search" between a head surface and the brain surface expressed as a straight line.

Applicant's arguments are moot because Yamashita was not relied on for this teaching.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Thu 8:30 AM to 7:00 PM (Off Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tse Chen can be reached on (571)272-3672. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./
Examiner, Art Unit 3777

/Tse Chen/
Supervisory Patent Examiner, Art Unit 3777